

SEMICONDUCTOR DEVICES HAVING A HYBRID CHANNEL LAYER,
CURRENT APERTURE TRANSISTORS AND METHODS OF FABRICATING
SAME

ABSTRACT OF THE DISCLOSURE

Transistors and/or methods of fabricating transistors that include a source contact, drain contact and gate contact are provided. In some embodiments, a channel region is provided between the source and drain contacts and at least a portion of the channel regions includes a hybrid layer comprising semiconductor material. In particular embodiments of the present invention, the transistor is a current aperture transistor. The channel region may include pendeo-epitaxial layers or epitaxial laterally overgrown layers. Transistors and methods of fabricating current aperture transistors that include a trench that extends through the channel and barrier layers and includes semiconductor material therein are also provided.